

<b>Notice of Allowability</b>	Application No.	Applicant(s)	
	10/646,190	AMBLARD ET AL.	
	Examiner	Art Unit	
	Roy M. Punnoose	2877	

**-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--**  
 All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included, herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to amendment filed on 12/08/2005.
2. ☒ The allowed claim(s) is/are 1-25.
3. ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
  - a) ☐ All    b) ☐ Some\*    c) ☐ None    of the:
    1. ☐ Certified copies of the priority documents have been received.
    2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
    3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

\* Certified copies not received: \_\_\_\_\_.

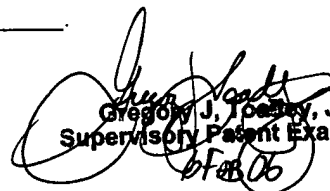
Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.  
**THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.**

4. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.
5. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
  - (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached
    - 1) ☐ hereto or 2) ☐ to Paper No./Mail Date \_\_\_\_\_.
  - (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date \_\_\_\_\_.

Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).
6. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

**Attachment(s)**

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|---|--|
| <ol style="list-style-type: none"> <li>1. <input type="checkbox"/> Notice of References Cited (PTO-892)</li> <li>2. <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)</li> <li>3. <input type="checkbox"/> Information Disclosure Statements (PTO-1449 or PTO/SB/08),<br/>Paper No./Mail Date _____</li> <li>4. <input type="checkbox"/> Examiner's Comment Regarding Requirement for Deposit of Biological Material</li> </ol> | <ol style="list-style-type: none"> <li>5. <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)</li> <li>6. <input type="checkbox"/> Interview Summary (PTO-413),<br/>Paper No./Mail Date _____</li> <li>7. <input type="checkbox"/> Examiner's Amendment/Comment</li> <li>8. <input checked="" type="checkbox"/> Examiner's Statement of Reasons for Allowance</li> <li>9. <input type="checkbox"/> Other _____</li> </ol> |
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 Gregory J. Tooley, Jr.  
 Supervisory Patent Examiner

**DETAILED ACTION**

***Response to Amendment***

1. Acknowledgement is made of applicant's amendments and arguments filed on December 08, 2005. The Examiner has accepted the amendments and remarks/arguments presented by the applicant.
2. The applicant has amended claims 1, 10 and 17. Claims 1-25 are currently pending in the application.

***Allowable Subject Matter***

3. Claims 1-25 are allowable.
4. Claim 1 is allowable because, prior art of record taken alone or in combination, fails to disclose or render obvious a monitoring component that analyzes the photoresist and controls the application of heat by the non-lithographic shrink component so as to heat the photoresist to a flow-point just prior to a melting point of the photoresist to mitigate line edge roughness on the pattern lines while retaining a target critical dimension, in combination with the rest of the limitations of said claim.
5. Claims 2-9 are allowable because they are dependent on independent claim 1 or an intermediate claim, and they include all the allowable limitations of the parent claim(s).
6. Claims 10 is allowable because the prior art of record, taken alone or in combination, fails to disclose or render obvious a method for mitigating the deleterious effects of an imperfect bottom anti-reflective layer (BARC) on a patterned semiconductor device comprising employing a non-lithographic shrink technique to heat a photoresist to a glass transition temperature of the

photoresist so that the photoresist begins to exhibit fluid properties to mitigate extant line-edge roughness, in combination with the rest of the limitations of claim 10.

7. Claims 11-16 are allowable because they are dependent on independent claim 10, and they include all the allowable limitations of the parent claim(s).

8. Claim 17 is allowable because, prior art of record taken alone or in combination, fails to disclose or render obvious a system for mitigating line-edge roughness on a patterned semiconductor device comprising means for maintaining a desired critical dimension during thermal reduction of line-edge roughness, in combination with the rest of the limitations of said claim.

9. Claims 18-25 are allowable because they are dependent on independent claims 17 or an intermediate claim, and they include all the allowable limitations of the parent claim(s).

10. Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

***Contact/Status Information***

11. Any inquiry concerning this communication or earlier communications from the examiner should be directed to **Roy M. Punnoose** whose telephone number is **571-272-2427**.

The examiner can normally be reached on 9:00 AM - 5:30 PM.

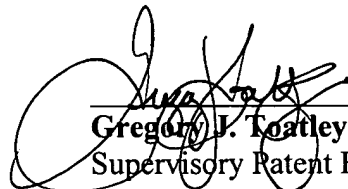
If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, **Gregory J. Toatley, Jr.** can be reached on **571-272-2800 ext.77**. The fax phone number for the organization where this application or proceeding is assigned is **571-273-8300**.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

**Roy M. Punnoose**  
Patent Examiner  
Art Unit 2877  
February 05, 2006



  
\_\_\_\_\_  
**Gregory J. Toatley, Jr.**  
Supervisory Patent Examiner  
6 Feb 06